

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Tsuyoshi OKI
Atsushi HAYAMI

Serial No. Not Yet Assigned

Filed: February 12, 2002

For: RECORDING METHOD, RECORDING APPARATUS, TRANSMITTING APPARATUS,
REPRODUCING METHOD, REPRODUCING APPARATUS, RECEIVING
APPARATUS, RECORDING MEDIUM, AND TRANSMISSION MEDIUM

PRELIMINARY AMENDMENT

The Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examining on the merits and calculating the filing fee for the above-captioned patent application, please amend the application as follows:

IN THE CLAIMS

Please amend claims 19, 21, 23, 25 and 27-30 as per attached with this preliminary amendment. In addition, please add claims 31-38 as per attached with this preliminary amendment. Pursuant to the new rules implementing the AIPA, a clean copy of the amended claims is attached along with a marked-up copy of the claims indicating the proposed claims amendments.

REMARKS

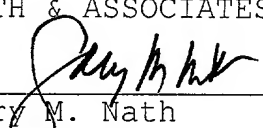
The claims have been amended to remove multiple dependencies. The amendments and newly added claims do not add any new matter within the meaning of 35 U.S.C. §132.

Early action on the merits is earnestly solicited.

Respectfully submitted,

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2002 FEB 12 10 30 AM

APPENDIX A: MARKED-UP COPY OF CLAIM AMENDMENTS

(Amended) 19. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording method according to claim 1 is recorded, [or a recording medium in which said recording signal generated using the recording apparatus according to claim 9 is recorded,] said reproducing apparatus comprising: reproduction signal processing means for: detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code

word Ck-1 with said case information detected from said code word Ck-1 and said state information of said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Amended) 21. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording method according to claim 3 is recorded, [or a recording medium in which said recording signal generated using the recording apparatus according to claim 9 is recorded,] said reproducing apparatus comprising: reproduction signal processing means for: detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code

word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Amended) 23. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the recording method according to claim 1 is transmitted, [or a transmission medium in which said recording signal generated using the transmitting apparatus according to claim 12 is

transmitted,] said reproducing apparatus
comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit
pattern longer than a maximum run length of a
predetermined run length restriction rule from a
reproduction signal obtained by reproducing data
from said recording medium; detecting case
information indicating a possible state of a code
word C_k to a plurality of coding tables based on a
zero run length on an LSB side of a code word C_{k-1}
following the code word C_k in a code word string
following the synchronous signal; computing state
information of the coding table used in coding
said code word C_k based on said case information
detected from said code word C_{k-1} ; demodulating an
output data word D_{k-1} corresponding to said code
word C_{k-1} with said case information detected from
said code word C_{k-1} and said state information of
said code word C_k ; repeating these in a time
series order and obtaining an output data word
string; and detecting auxiliary information
including a sector address and a parity by a
product code from said output data word string

based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

(Amended) 25. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the recording method according to claim 3 is transmitted, [or a transmission medium in which said recording signal generated using the transmitting apparatus according to claim 12 is transmitted,] said reproducing apparatus comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information

detected from said code word Ck-1; demodulating an output data word Dk-1 corresponding to said code word Ck-1 with said case information detected from said code word Ck-1 and said state information of said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

(Amended) 27. A recording medium wherein a recording signal generated using the recording method according to claim 1 [or said recording signal generated using the recording apparatus according to claim 9] is recorded.

(Amended) 28. A recording medium wherein a recording signal generated using the recording method according to claim 3 [or said recording signal generated using the recording apparatus according to claim 9] is recorded.

(Amended) 29. A transmission medium wherein a recording signal generated using the recording method according to

claim 1 [or said recording signal generated using the transmitting apparatus according to claim 12] is transmitted therethrough.

(Amended) 30. A transmission medium wherein a recording signal generated using the recording method according to claim 3 [or said recording signal generated using the transmitting apparatus according to claim 12] is transmitted therethrough.

(Added) 31. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording apparatus according to claim 9 is recorded, said reproducing apparatus comprising:
reproduction signal processing means for:
detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state

information of the coding table used in coding
said code word Ck based on said case information
detected from said code word Ck-1; demodulating an
output data word Dk-1 corresponding to said code
word Ck-1 with said case information detected from
said code word Ck-1 and said state information of
said code word Ck; repeating these in a time
series order and obtaining an output data word
string; and detecting auxiliary information
including a sector address and a parity by a
product code from said output data word string
based on said synchronous signal to reconstitute
an ECC block, and reproducing signals obtained
thereby.

- (Added) 32. A reproducing apparatus for reproducing data from
a recording medium in which a recording signal
generated using the recording apparatus according
to claim 9 is recorded, said reproducing apparatus
comprising:
reproduction signal processing means for:
detecting a synchronous signal including a bit
pattern longer than a maximum run length of a
predetermined run length restriction rule from a
reproduction signal obtained by reproducing data

from said recording medium; detecting case information indicating a possible state of a code word Ck to a plurality of coding tables based on a zero run length on an LSB side of a code word Ck-1 following the code word Ck in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word Ck based on said case information detected from said code word Ck-1; demodulating an output data word Dk-1 corresponding to said code word Ck-1 with said case information detected from said code word Ck-1 and said state information of said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Added) 33. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the transmitting apparatus according to claim 12 is transmitted, said reproducing apparatus

comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute

an ECC block, and reproducing signals obtained thereby.

- (Added) 34. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the transmitting apparatus according to claim 12 is transmitted, said reproducing apparatus comprising:

reproduction signal processing means for:
detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of

said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Added) 35. A recording medium wherein a recording signal generated using the recording apparatus according to claim 9 is recorded.
- (Added) 36. A recording medium wherein a recording signal generated using the recording apparatus according to claim 9 is recorded.
- (Added) 37. A transmission medium wherein a recording signal generated using the transmitting apparatus according to claim 12 is transmitted therethrough.
- (Added) 38. A transmission medium wherein a recording signal generated using the transmitting apparatus according to claim 12 is transmitted therethrough.

APPENDIX B: CLEAN COPY OF CLAIMS AMENDED AND ADDED

(Amended) 19. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording method according to claim 1 is recorded, said reproducing apparatus comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of

said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Amended) 21. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording method according to claim 3 is recorded, said reproducing apparatus comprising:
- reproduction signal processing means for:
- detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state

information of the coding table used in coding said code word Ck based on said case information detected from said code word Ck-1; demodulating an output data word Dk-1 corresponding to said code word Ck-1 with said case information detected from said code word Ck-1 and said state information of said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Amended) 23. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the recording method according to claim 1 is transmitted, said reproducing apparatus comprising:
- reproduction signal processing means for:
- detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data

from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Amended) 25. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the recording method according to claim 3 is transmitted, said reproducing apparatus

comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute

an ECC block, and reproducing signals obtained thereby.

(Amended) 27. A recording medium wherein a recording signal generated using the recording method according to claim 1 is recorded.

(Amended) 28. A recording medium wherein a recording signal generated using the recording method according to claim 3 is recorded.

(Amended) 29. A transmission medium wherein a recording signal generated using the recording method according to claim 1 is transmitted therethrough.

(Amended) 30. A transmission medium wherein a recording signal generated using the recording method according to claim 3 is transmitted therethrough.

(Added) 31. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording apparatus according to claim 9 is recorded, said reproducing apparatus comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data

from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Added) 32. A reproducing apparatus for reproducing data from a recording medium in which a recording signal generated using the recording apparatus according to claim 9 is recorded, said reproducing apparatus

comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of said code word C_k ; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute

an ECC block, and reproducing signals obtained thereby.

- (Added) 33. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the transmitting apparatus according to claim 12 is transmitted, said reproducing apparatus comprising:

reproduction signal processing means for:

detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word C_k to a plurality of coding tables based on a zero run length on an LSB side of a code word C_{k-1} following the code word C_k in a code word string following the synchronous signal; computing state information of the coding table used in coding said code word C_k based on said case information detected from said code word C_{k-1} ; demodulating an output data word D_{k-1} corresponding to said code word C_{k-1} with said case information detected from said code word C_{k-1} and said state information of

said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Added) 34. A receiving apparatus for receiving a transmission medium in which a recording signal generated using the transmitting apparatus according to claim 12 is transmitted, said reproducing apparatus comprising:
- reproduction signal processing means for:
- detecting a synchronous signal including a bit pattern longer than a maximum run length of a predetermined run length restriction rule from a reproduction signal obtained by reproducing data from said recording medium; detecting case information indicating a possible state of a code word Ck to a plurality of coding tables based on a zero run length on an LSB side of a code word Ck-1 following the code word Ck in a code word string following the synchronous signal; computing state

information of the coding table used in coding said code word Ck based on said case information detected from said code word Ck-1; demodulating an output data word Dk-1 corresponding to said code word Ck-1 with said case information detected from said code word Ck-1 and said state information of said code word Ck; repeating these in a time series order and obtaining an output data word string; and detecting auxiliary information including a sector address and a parity by a product code from said output data word string based on said synchronous signal to reconstitute an ECC block, and reproducing signals obtained thereby.

- (Added) 35. A recording medium wherein a recording signal generated using the recording apparatus according to claim 9 is recorded.
- (Added) 36. A recording medium wherein a recording signal generated using the recording apparatus according to claim 9 is recorded.
- (Added) 37. A transmission medium wherein a recording signal generated using the transmitting apparatus according to claim 12 is transmitted therethrough.
- (Added) 38. A transmission medium wherein a recording signal

generated using the transmitting apparatus
according to claim 12 is transmitted therethrough.